

REMARKS

The above referenced patent application has been reviewed in light of the Office Action, dated November 09, 2009, in which:

- claims 1-3, 7, 9, 10, 22, 23, 33, 34, and 40 are rejected under 35 U.S.C. § 102(e) as allegedly being anticipated by Moriuchi (US Patent No. 6,556,637);
- claims 12, 14 are rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Moriuchi in view of Mann *et al.* (hereafter, 'Mann,' US Patent No. 5,684,434);
- claims 16 and 17 are rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Moriuchi and Mann in further view Cao (US Publication No. 2001/0033407);
- claims 4, 24, and 36 are rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Moriuchi in view of Cao;
- claim 5, 6, and 13 are rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Moriuchi, and Mann and in further view of Cao;
- claims 11 and 25 are rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Moriuchi in view of Shimizu *et al.* (hereafter, "Shimizu"; US Patent No. 4,469,438);
- claim 15 is rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Moriuchi and Mann in further view of Shimizu;
- claim 18 is rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Moriuchi, Cao, and Mann in further view of Shimizu;
- and claims 8, 19-21, 26-32, 37-39 and 41-47 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form.

Reconsideration of the above referenced patent application in view of the foregoing amendments and the following remarks is respectfully requested.

Claims 1-47 are now pending in the above referenced patent application. Claims 1-4, 40 and 41 have been amended; such amendments are supported by the specification and claims as originally filed, specifically but limited to, Figs 6, and 9-11. No claims have been cancelled or added. No new matter has been entered.

1. 35 U.S.C. § 102

1.1. *Moriuchi: Claims 1-3, 7, 9, 10, 22, 23, 33, 34, and 40*

The PTO has rejected claims 1-3, 7, 9, 10, 22, 23, 33, 34, and 40 under 35 U.S.C. § 102 as being anticipated by Moriuchi. This rejection by the PTO of these claims is respectfully traversed.

It is well-established that in order to establish a *prima facie* case of anticipation under § 102 of the patent statute, the PTO must provide a single prior art document that alone has every element and every limitation of the claim being rejected. Therefore, if even a single element or limitation is not met by the asserted document, then the PTO has not succeeded in establishing a *prima facie* case.

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Brothers v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Assignee begins with claim 1. Claim 1 recites:

1 1: (Currently Amended) An integrated decision feedback equalizer and clock and data recovery
2 circuit, comprising:
3 a decision feedback equalizer including:
4 a flip-flop that outputs a first feedback signal, and
5 a sub-portion of a plurality of latches, wherein each latch of the sub-portion of
6 the plurality of latches outputs a respective latch-generated feedback signal;
7 a clock recovery circuit including:
8 the flip-flop that outputs a first phase detector input signal, and
9 the plurality of latches, wherein each latch in the plurality of latches outputs a
10 respective latch-generated phase detector input signal,

11 wherein the plurality of latches receives the output of the flip-flop as a first input
12 to the plurality of latches, and

13 wherein the plurality of latches includes both the sub-portion of a plurality of
14 latches and latches which are not included by the sub-portion of a plurality of latches; and

15 the flip-flop that is included by both the decision feedback equalizer and the clock
16 recovery circuit.

It is respectfully asserted that, as just one example of how the text cited by the PTO fails to meet the language of the rejected claims, Moriuchi does not show, teach, use, or describe a **“plurality of latches, wherein each latch outputs a respective latch-generated phase detector input signal”** and **“a sub-portion of a plurality of latches [that] outputs a respective latch-generated feedback signal”**.

1.1.1. Response to Examiner's Comments

In the November 11, 2009 Office Action the Examiner stated on page 3:

Neither applicant's specification nor drawings disclose "flip-flop that comprises a portion of both the decision feedback equalizer and the clock recovery circuit". The flip-flops (470,472) are within the DFE (410). However, the extracted clock signal 412 is used to clock the flip-flops of the DFE.

First, it is respectfully asserted that if the PTO feels this way the proper response would be a § 112 Enablement rejection and not a § 102 Anticipation rejection.

Secondly, it is respectfully asserted that such a flip-flop may be seen in Assignee's application as originally filed in Fig. 6 (flip-flop 610), Fig. 9 (flip-flop 912), Fig. 10 (flip-flop 1010), and Fig. 11 (flip-flop 1120). All of these flip-flops act both as tap generators in the DFE and as phase detector signal generators in the clock recovery circuits.

1.1.2. Output of Latches, claim 1

The PTO asserts that Moriuchi shows “a plurality of latches ... (col. 7 lines 2-4)”. See Nov. Office Action page 8. It is acknowledged that Moriuchi shows a series of 12 flip-flops 47.

Further, Assignee will stipulate that a flip-flop is commonly comprised of two back-to-back latches (See Wikipedia entries in the IDS associated with this Reply and RCE); although a flip-flop need not be comprised of any latches. **However, it is not stipulated that a flip-flop is a latch.** In fact, it is strongly asserted that a flip-flop is, by definition and function, not a latch. As is well known (again see IDS material), “[t]he advantage of the D flip-flop over the D-type latch is that it ‘captures’ the signal at the moment the clock goes high, and subsequent changes of the data line do not influence Q until the next rising clock edge.” Flip-flops may comprise two latches but a flip-flop is not a latch. In *arguendo*, Assignee will discuss Moriuchi as if the flip-flops 47 are comprised in the most favorable way to the PTO (*i.e.*, as if each flip-flop 47 is comprised of two latches).

It is respectfully asserted that in Moriuchi’s Fig. 7 only the output of every other latch (*i.e.*, the output or slave of each of the flip-flops 47) is provided as the final outputs of the shift register 44 and therefore as possible inputs to the FBE 45 or the TED 61. As can be seen by the embodiments of Assignee’s invention illustrated by Fig. 6, *etc.* only half of the latches (*e.g.*, latch 614) “output[] respective latch-generated feedback signals” which are then used in the feedback of the DFE. Moriuchi’s Figs. 4 and 7 show that half of the latches (*i.e.*, the output or slave latch of each flip-flop 47) are used in the feedback of the DFE. In *arguendo*, Assignee’s latches 612 and 614 make up one of Moriuchi’s flip-flops 47.

However, it will be noticed that in the embodiments of Assignee’s invention illustrated by Fig. 6, *etc.* **all** of the latches (*e.g.*, both latches 612 and 614) “output ... [a] latch-generated phase detector input signal”, which is used by the clock recovery circuit. It is respectfully

asserted that Moriuchi's shift-register 44 and flip-flops 47 do **not** do this. Only **every other one of Moriuchi's latches** (*i.e.*, the output latch of the flip-flops 47) "output ... [a] latch-generated phase detector input signal".

More importantly, it is noted that the limitations of claim 1 are not confined to "half", "all", or "every other". Instead the limitation of claim 1 in question requires that more latches in the plurality of latches outputs "latch-generated phase detector input signal[s]" than the number of latches that output "latch-generated feedback signal[s]". See claim 1, lines 13 and 14¹. It is respectfully asserted that Moriuchi does not do this. Every signal that is produced by a latch and that is used as a "latch-generated phase detector input signal" (*i.e.*, input into TED 61) is also used as a "latch-generated feedback signal" (*i.e.*, input into FBE 45). Further, because Moriuchi is a little loose or sloppy in his use of the term "a(n)" to describe a(n), a(n-1), or a(n-12), it is difficult to determine if Moriuchi doesn't use more latch outputs as "latch-generated feedback signal[s]" than "latch-generated phase detector input signal[s]" (*i.e.*, inputs into TED 61). **At best, Moriuchi only uses the same number of latches to generate phase detector input signals as feedback input signals, not the "more than" latches required by Assignee's claim 1.**

As such, Moriuchi is simply wired differently from Assignee's claim. Therefore, Moriuchi does not show all the elements of claim 1 and the PTO has not established a *prima facie* case of anticipation under § 102.

¹ It is noted that Assignee is **not** attempting to bring limitations from the specification into the claim. Assignee has amended the claim to include the limitations. Assignee merely uses Fig. 6 as an example embodiment to illustrate the deficiencies within Moriuchi.

1.1.3. Latches Output-to-Input Wiring, claim 33

Assignee continues with claim 33. Claim 33 recites:

1 33. (Original) An integrated retimer and phase detector, comprising:
2 a flip-flop comprising:
3 at least one data input for receiving a binary data signal generated from a
4 received signal;
5 at least one clock input for receiving an extracted clock signal; and
6 at least one output for outputting a first output signal, wherein the first output
7 signal comprises a feedback signal for a decision feedback equalizer and a first phase detector
8 signal for a clock recovery circuit;
9 a first latch comprising:
10 at least one data input for receiving the first output signal;
11 at least one clock input for receiving the extracted clock signal; and
12 at least one output for providing a second phase detector signal for the clock
13 recovery circuit; and
14 a second latch comprising:
15 at least one data input for receiving the second phase detector signal;
16 at least one clock input for receiving the extracted clock signal; and
17 at least one output for providing a second output signal, wherein the second
18 output signal comprises a third phase detector signal for the clock recovery circuit.

The PTO asserts that Moriuchi shows “a second latch comprising: at least one data input for receiving the second phase detector signal (fig.7)” and “at least one output for providing a second output signal ... compris[ing] a third phase detector signal for the clock recovery circuit (col. 6 lines 53-55)”. See Nov. Office Action page 10.

As described above, in *arguendo*, Moriuchi may show a series of paired latched (*i.e.*, flip-flops 47). But the output of the slave latch of a first flip-flop (which the PTO asserts outputs “the second phase detector signal”) is not, by virtue of how a flip-flop works, input into a second slave latch of a second flip-flop (which the PTO asserts outputs “the third phase detector

signal”). There is an intervening master latch in the second flip-flop. And in order for Moriuchi to work, this intervening master latch must be there.

Referring again to the embodiments of Assignee’s invention shown in Fig. 6, *etc.*, it can be seen that while, latches 612 and 614 may together comprise a flip-flop, the second phase detector signal is output from the middle of the “flip-flop” (*i.e.*, latch 612) and input into the second latch (*i.e.*, latch 614) which in turn outputs the third phase detector signal. **Moriuchi does not input the second phase detector signal into the same latch the produces the third phase detector signal. Moriuchi inputs the second phase detector signal into an intervening latch.** Therefore, Moriuchi does not fulfill all the limitations of the claim.

It is understood that the above are merely a few illustrative examples to which the claims are not limited; these illustrations are merely provided to help the PTO understand the claim.

Without addressing the remarks made in the Office Action with respect to claims 2, 3, 7, 9, 10, 22, 23, 34, and 40, which are not conceded and are believed to be moot, Assignee notes that claims 2, 3, 7, 9, 10, 22, 23, 34, and 40 ultimately depend from either claims 1 or 33 and include all of its limitations, or include a substantially similar and patentably distinct limitation as claims 1 and 33, discussed above. Therefore, these claims patentably distinguish from the cited patents on the same basis as either claims 1 or 33. It is, therefore, respectfully requested that the PTO withdraw the rejections of these claims.

2. 35 U.S.C. § 103

2.1. *Moriuchi and Mann: Claims 12 and 14*

The PTO has also rejected claims 12 and 14 under 35 U.S.C. § 103 based upon Moriuchi in combination with Mann. The rejection of these claims is respectfully traversed.

M.P.E.P. § 706.02(j) sets forth the standard for a § 103 rejection:

35 U.S.C. 103 authorizes a rejection where, to meet the claim, it is necessary to modify a single reference or to combine it with one or more other references. After indicating that the rejection is under 35 U.S.C. 103, the examiner should set forth in the Office action:

- (A) the relevant teachings of the prior art relied upon, preferably with reference to the relevant column or page number(s) and line number(s) where appropriate,
- (B) the difference or differences in the claim over the applied reference(s),
- (C) the proposed modification of the applied reference(s) necessary to arrive at the claimed subject matter, and
- (D) an explanation why one of ordinary skill in the art at the time the invention was made would have been motivated to make the proposed modification.

Assignee respectfully asserts that the combination set forth by the PTO fails to meet the requirement for a *prima facie* case for a § 103 rejection for at least the following reasons.

Assignee begins with claim 12. Claim 12 recites:

12. (Original) An integrated decision feedback equalizer and clock and data recovery circuit, comprising:
a summer coupled to receive an input data signal and at least one scaled feedback signal to generate a soft decision data signal;
a slicer coupled to receive the soft decision data signal to generate a binary data signal;
a flip-flop coupled to receive the binary data signal and an extracted clock signal to generate a first output signal;
a plurality of latches coupled to receive the first output signal to generate second output signals;
a charge pump coupled to receive at least one phase detector output signal associated with the first output signal and the second output signals;
a loop filter coupled to receive an output signal from the charge pump;

13 a voltage controlled oscillator coupled to receive an output signal from the loop filter to
14 generate the extracted clock signal; and

15 a multiplier coupled to receive the first output signal to generate the at least one scaled
16 feedback signal.

Assignee respectfully asserts that the combination set forth by the PTO fails to meet the requirement for a *prima facie* case for a § 103(a) rejection for at least the following reasons.

It is respectfully asserted that neither Moriuchi nor Mann, either alone or in combination, suggests or describes either “**a summer coupled to receive ... at least one scaled feedback signal**” or “**a multiplier coupled ... to generate the at least one scaled feedback signal**”. The PTO asserts that Moriuchi teaches this limitation. However, it is respectfully asserted that Moriuchi does **not** teach this limitation.

It is respectfully asserted that the PTO’s suggested circuit from Moriuchi does not route the signals properly as dictated by Assignee’s claim 12. The PTO asserts that the multiplier of claim 12, line 15 is Moriuchi’s “1-bit multiplier” 67 of Fig. 8 which is part of Moriuchi’s “timing error detector (TED) 61” of Figs. 4 and 8. In order to fulfill the limitation of claim 12, lines 15 and 16, the multiplier must “**generate the at least one scaled feedback signal**”. This feedback signal is **received by the “summer”** of claim 1, line 3. However, the PTO asserts this summer (line 3) limitation is met by Moriuchi’s adder 42. Which, as can be seen in the previously reproduced Moriuchi Fig. 4, only receives signals from the FFE 41 and the FBE 45 (signal S2), not the PTO’s multiplier (TED 61).

As a result, it is respectfully asserted that there can only be one of two logical conclusions, **the “scaled feedback signal” in the PTO’s proposed circuit is either:**

- 1) Moriuchi’s TE(n) which is generated by Moriuchi’s TED 61 (the PTO’s multiplier of claim 12, line 15), and

therefore, Moriuchi’s **adder 42 cannot be the summer of claim 12** as it does not receive the proposed “scaled feedback signal” (Moriuchi’s TE(n)) , but instead Moriuchi’s S2; or
- 2) Moriuchi’s S2 which is received by Moriuchi’s adder 42 (the PTO’s summer of claim 12, line 3), and

therefore, Moriuchi’s TED 61 and its sub-component **multiplier 67 cannot be the multiplier of claim 12** as it does not produce the proposed “scaled feedback signal” (Moriuchi’s S2), but instead Moriuchi’s TE(n).

Therefore, it is respectfully asserted that the PTO’s proposed circuit is logically inconsistent and cannot be made to route the required signals to the required elements. Namely, the “scaled feedback signal” of claim 12, lines 3, 15 and 16 is not routed or connected as claim 12 dictates. Therefore, not all the claim limitations have been met.

The PTO does not assert that Mann ameliorates this deficiency. Therefore, even if the combination were proper, although Assignee believes that it is not, nonetheless, the combination would still fail to produce the invention as recited in the rejected claims. It is, therefore, respectfully requested that the rejection of this claim be withdrawn.

2.1.1. Response to Examiner's Comments

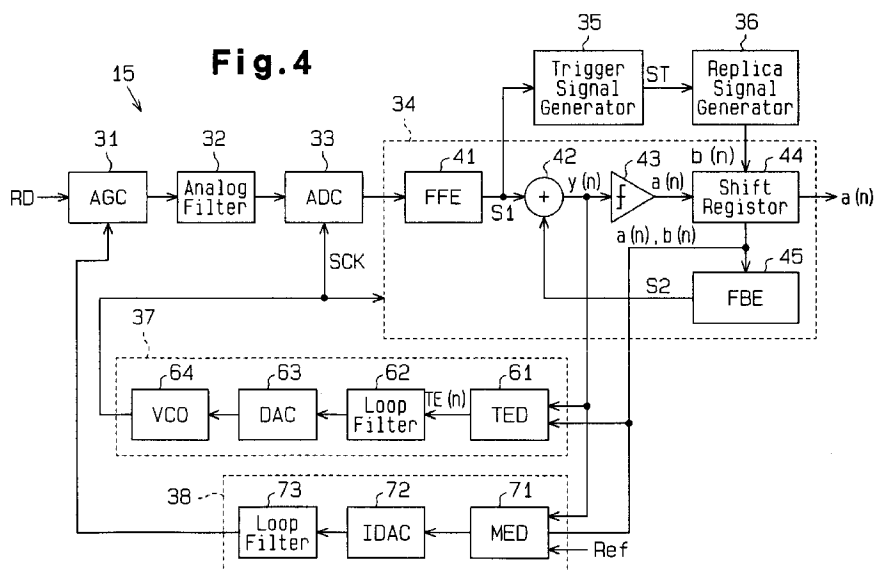
In the November 11, 2009 Office Action the Examiner stated on page 6:

In figure 4, Moriuchi shows a summer (42) coupled to receive at least one scaled feedback signal (S2) from the FBE (45;col. 5 lines 3-5).

In figure 8, a multiplier (67) receives $a(n)$ and $y(n)$ from the flip-flop (44) and adder (42) and generates TE(n) signal. The generated signal is feedback to the DFE.

Assignee thanks the Examiner for agreeing with the Assignee's points. The Examiner has admitted that the "scaled feedback signal (S2)" is not output by the multiplier 67. "In figure 8, a multiplier (67) ... generates **TE(n)** signal." Signal TE(n) is **not** signal S2.

Multiplier 67 is part of TED 61 (see Fig. 8). As shown in Fig. 4, TED 61 does not produce "scaled feedback signal (S2)". That is produced by FBE 45. If multiplier 67 does not produce the "scaled feedback signal (S2)" then the combination of Moriuchi with Mann does not fulfill each and every limitation of the rejected claims and they must be allowed.



Without addressing the remarks made in the Office Action with respect to claim 14, which are not conceded and are believed to be moot, Assignee notes that claim 14 ultimately depends from claim 12 and includes all of its limitations, or includes a substantially similar and patentably distinct limitation as claim 12, discussed above. Therefore, the claim patentably distinguishes from the cited patents on the same basis as claim 12. It is, therefore, respectfully requested that the PTO withdraw the rejections of these claims.

2.2. Moriuchi, Mann and Cao: Claims 16 and 17

The PTO has also rejected claims 16 and 17 under 35 U.S.C. § 103 on Moriuchi and Mann in further view Cao. The rejection of these claims is also traversed.

Without addressing the remarks made in the Office Action with respect to these claims, which are not conceded and are believed to be moot, Assignee notes that these claims ultimately depend from claims 1, 33, or 12 and include all of their respective claim's limitations, or include a substantially similar and patentably distinct limitation as claims 1, 33, and/or 12, discussed above. Therefore, these claims patentably distinguish from the cited patents on the same basis as either claims 1, 33, and/or 12. It is, therefore, respectfully requested that the PTO withdraw the rejections of these claims.

2.3. Moriuchi and Cao: Claims 4, 24, and 36

The PTO has also rejected claims 4, 24, and 36 under 35 U.S.C. § 103 on Moriuchi in further view Cao. The rejection of these claims is also traversed.

Without addressing the remarks made in the Office Action with respect to these claims, which are not conceded and are believed to be moot, Assignee notes that these claims ultimately depend from claims 1, 33, or 12 and include all of their respective claim's limitations, or include a substantially similar and patentably distinct limitation as claims 1, 33, and/or 12, discussed above. Therefore, these claims patentably distinguish from the cited patents on the same basis as either claims 1, 33, and/or 12. It is, therefore, respectfully requested that the PTO withdraw the rejections of these claims.

2.4. Moriuchi, Mann and Cao: Claims 5, 6, and 13

The PTO has also rejected claims 5, 6, and 13 under 35 U.S.C. § 103 on Moriuchi and Mann in further view Cao. The rejection of these claims is also traversed.

Without addressing the remarks made in the Office Action with respect to these claims, which are not conceded and are believed to be moot, Assignee notes that these claims ultimately depend from claims 1, 33, or 12 and include all of their respective claim's limitations, or include a substantially similar and patentably distinct limitation as claims 1, 33, and/or 12, discussed above. Therefore, these claims patentably distinguish from the cited patents on the same basis as either claims 1, 33, and/or 12. It is, therefore, respectfully requested that the PTO withdraw the rejections of these claims.

2.5. Moriuchi and Shimizu: Claims 11 and 25

The PTO has also rejected claims 11 and 25 under 35 U.S.C. § 103 on Moriuchi in further view Shimizu. The rejection of these claims is also traversed.

Without addressing the remarks made in the Office Action with respect to these claims, which are not conceded and are believed to be moot, Assignee notes that these claims ultimately depend from claims 1, 33, or 12 and include all of their respective claim's limitations, or include a substantially similar and patentably distinct limitation as claims 1, 33, and/or 12, discussed above. Therefore, these claims patentably distinguish from the cited patents on the same basis as either claims 1, 33, and/or 12. It is, therefore, respectfully requested that the PTO withdraw the rejections of these claims.

2.6. Moriuchi, Mann and Cao: Claim 15

The PTO has also rejected claim 15 under 35 U.S.C. § 103 on Moriuchi and Mann in further view Shimizu. The rejection of these claims is also traversed.

Without addressing the remarks made in the Office Action with respect to these claims, which are not conceded and are believed to be moot, Assignee notes that these claims ultimately depend from claims 1, 33, or 12 and include all of their respective claim's limitations, or include a substantially similar and patentably distinct limitation as claims 1, 33, and/or 12, discussed above. Therefore, these claims patentably distinguish from the cited patents on the same basis as either claims 1, 33, and/or 12. It is, therefore, respectfully requested that the PTO withdraw the rejections of these claims.

2.7. Moriuchi, Mann, Shimizu and Cao: Claim 18

The PTO has also rejected claims 18 under 35 U.S.C. § 103 on Moriuchi and Mann, Shimizu in further view Cao. The rejection of these claims is also traversed.

Without addressing the remarks made in the Office Action with respect to these claims, which are not conceded and are believed to be moot, Assignee notes that these claims ultimately depend from claims 1, 33, or 12 and include all of their respective claim's limitations, or include a substantially similar and patentably distinct limitation as claims 1, 33, and/or 12, discussed above. Therefore, these claims patentably distinguish from the cited patents on the same basis as either claims 1, 33, and/or 12. It is, therefore, respectfully requested that the PTO withdraw the rejections of these claims.

CONCLUSION

In view of the foregoing, it is respectfully asserted that all claims pending in this application are in condition for allowance. If the Examiner has any questions, they are invited to contact the undersigned at 202-470-6450. Reconsideration of this patent application and early allowance of all claims is respectfully requested.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 50-3521.

Respectfully submitted,

Tuesday, February 09, 2010

Dated

/Justin B. Scout, Reg. No. 54,431/

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Tuesday, February 09, 2010

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